

PULSED SPECTROSCOPY WITH SPATIALLY VARIABLE
POLARIZATION MODULATION ELEMENT

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ABSTRACT

10 A metrology device, such as an ellipsometer, includes a light source that produces
a pulsed electromagnetic beam, such as a flash bulb or pulsed laser, and a spatially
dependent polarizing element that introduces a spatially dependent retardation in the light
beam. The use of a pulsed light source is advantageous over a continuous light source, as
a pulsed light source generates less heat, is stronger, lasts longer, and does not need the
use of a mechanical shutter. The use of a spatially dependent polarizing element
advantageously eliminates the use of temporally dependent moving polarization
modulation elements, thereby allowing the use of a pulsed light source. Downstream of
15 the spatially dependent polarizing element are the analyzer and a multi-element detector
that may be synchronized with the pulsed electromagnetic beam to detect after one or
several pulses of light have been emitted from the pulsed light source.